AMERICAN VETERINARY REVIEW.

OCTOBER, 1893.

EDITORIAL.

FIRST VETERINARY CONGRESS OF AMERICA.—The day is now fast approaching which will see those who entertain a real interest in the success of the important movement contemplated by the veterinary profession of America in their scheme for bringing together in convention the veterinarians of the world, and who shall not be hindered from attendance by insurmountable obstacles and uncontrollable reasons, or by professional obligations or sickness, busy with their final preparations for the trip which will bring together from all points of the compass a majority, we trust, of the veterinary practitioners of this continent. It is then for the last time that we call the attention of our readers to the coming event. What more we may have to say hereafter, will be of the hereafter.

The question is now in order, will this proposed congress prove to be the grand success which its best friends hope and wish it to be, and will try to make it? This, however, is scarcely to be expected from a first attempt of this kind by our veterinarians. Without doubt, there will be errors committed in the management of the affair, as well as accidents encountered, and, if possible, it is better that these should be anticipated now, than that they should surprise us when the day comes. Evidently everybody will not be satisfied. Some of our best veterinarians will, for one reason or another, fail to be present, and will therefore be unable to give the congress the benefit of their experience; and some, per-

haps, will deny or disparage the efforts made by the United States Veterinary Medical Association in inaugurating the enterprise. But all this must be met in the spirit of the old saying, "Better luck next time," or as it may be adapted in the spirit of prophecy for the next congress, "better work next time."

In any case, everything is, or at least ought to be, in a complete state of readiness now. Notices of the meeting were sent long ago to many of the veterinary papers of Europe, informing them of the congress and asking them to give them publicity in their various journals. These were courteously and cordially received, and our exchanges from England, France, Italy, Germany, Austria, etc., are now waiting for the programme which has been promised to them, and which they will publish.*

Unfortunately, through some error or neglect, this programme was not issued by the committee as early as was desired, or, at least, only came into our hands at a very late date. The final arrangements were difficult to adjust, and were so complicated in their nature that pardonable reasons for the delay may easily be found in behalf of those who had that matter committed to their charge. The following, we understand, is the programme which has been decided upon:

MONDAY, OCTOBER 16TH, 1893.—SPECIAL COMMITTEE MEETINGS

10 A.M.—Special Meeting of Local Committee of Arrangements.
11 A.M.—Special Meeting of International Commmittee.
1 P.M.—Special Meeting of the Comitia Minora.

TUESDAY, OCTOBER 17TH.

8.30 A.M.—Regular Meeting of the Comitia Minora.
10 A.M.—Annual Meeting convened.

ROLL CALL.

Address of Welcome to the Members, by President W. L. Williams.
Address of Welcome to the Visitors.
Reception and Consideration of Report of the Comitia Minora.
Report of Committee on Honorary Members.
1 P.M.—Adjournment for Lunch.
2 P.M.—Reconvened.

* The programme has been mailed since this was written.

REPORTS OF COMMITTEES.

Special Committee on International Meeting. Committee on Intelligence nd Education. Finance Committee. Committee on Diseases. Prize Committee. Committee on Army Legislation. Publication Committee. Special Committee on Incorporation. Secretary's Report. Reports from Assistant (State and Foreign) Secretaries.

READING OF PAPERS.

Millet Diseases of Horses, by Dr. T. D. Hinebauch, Fargo, N. D.

Biliary Hepatitis in Cattle (Pictou Cattle Disease), by Dr. Wyatt Johnson, Montreal, Can.

WEDNESDAY, OCTOBER 18TH.

9 A.M. to 1 P.M.—Popular Meeting under the Direction of the World's Fair Auxiliary Congresses.

1 P.M.—Adjournment for Lunch.

2 P. M.—Reconvened. Discussion of Reports of Committees.

READING OF PAPERS.

Fistulæ, by M. H. Reynolds, Keosauqua, Iowa.

A New Method of Treating Periodic Ophthalmia by Surgical Interference, by Dr. R. H. Harrison, Atchison, Kan.

Election of Officers.

New Business.

6 P.M.—Adjournment.

8 P.M.—Reception on the Lake by the Western Veterinarians.

THURSDAY, OCTOBER 19TH.—SPECIAL TOPIC FOR CONSIDERATION.

10 A.M.—*Veterinary Education*, by Dr. A. Liautard, Chairman.

1st. Veterinary Education as it was.

2d. Veterinary Education as it is.

3d. Veterinary Education as it ought to be.

DISCUSSION.

1 P.M.—Adjournment for Lunch.

2 P.M.—Reconvened.

READING OF PAPERS.

Swine-plague and Hog Cholera, by W. H. Welch and A. W. Clement, Baltimore, Md.

Has Contagious Pleuro-Pneumonia been Entirely Eradicated from the United States, by Dr. J. W. Gadsden, Philadelphia, Pa.

6 P.M.—Adjournment.

FRIDAY, OCTOBER 20TH —SPECIAL TOPIC FOR CONSIDERATION.

10 A.M.—*Animal Food*, by D. E. Salmon, Chairman.

1st. The Measures Necessary to Keep Meat-producing Animals free from Dangerous Diseases prior to Marketing.

2d. Meat Inspection from the Standpoint of Public Health.

3d. Meat Inspection from the Standpoint of National Economy.

DISCUSSION.

1 P.M.—Adjournment for Lunch.
2 P.M.—Reconvened.

SPECIAL TOPIC FOR CONSIDERATION.

Tuberculosis Committee, by Dr. A. W. Clement, Chairman.
1st. Nature and Extent of the Disease.
2d. Means of Controlling the Disease.
3d. Practicability of its Eradication from our Meat and Milk-producing Animals.

DISCUSSION.

Discussion of Papers and Reports of Cases.
6 P.M.—Adjournment.
7 P.M.—Banquet.

This is an extensive programme, and we are informed by some is considered to be overloaded. It is true that it is surrounded and protracted by numerous questions and special business matters of the committees of the Association, but this is a disadvantage which could not be avoided, if it is considered that this occasion possesses a double character, and will be not only the first veterinary congress of America, but the thirtieth anniversary of the United States Veterinary Medical Association as well.

As it is, we believe that every endeavor has been made to render the event a success. It remains now for the veterinarians of America to assist in the final effort by taking pains to be present at roll call.

VETERINARY COLLEGE OPENINGS. — When this number of the REVIEW will have reached the hands of our readers, the various veterinary colleges of the United States will have reopened their doors, students will have assumed their seats for the next term on the benches of the institutions they have selected as their future alma mater, and the work of the various faculties will have begun in earnest. There have been but few changes in the organization of the existing schools in respect to the duration of studies other than those already announced by one of the New York Colleges, or in the opportunities and facilities of students for acquiring the knowledge which they are seeking.

The American Veterinary College has, however, made ex-

tensive alterations in its building. A larger and more comfortable lecture-room has been erected, large rooms for laboratory work have been built, and the faculty is now ready to do justice, for years to come, to their patrons and friends—in any case, until the completion of the new building so much talked of. By the way, speaking of this institution, it has been intimated that the statements in its last announcement were lacking in frankness and candor, and that there was a kind of double meaning in the language referring to the requirements for graduation.

Those who know the gentlemen connected with that institution, and of its honest work for nineteen years, were prompt in defence of its honor, and it has been well championed, for the American Veterinary College has started a requirement of three years' college attendance, *and will enforce it.* Both the true and pretended, but false friends, of the institution will please not forget this. The special charter of the legislature, in section 5 of chapter 443 of the laws of 1888 has, it is true, laid down the power of the Board of Trustees (page 15 of the announcement), but the *faculty* has decided to start this year on a new departure, and to extend the curriculum to three years, dividing the students into classes of the first, second and third year, and requiring each student to pass an obligatory examination at the end of each respective session before he will be allowed to proceed. Which of the two-year schools will now be the first to follow?

CONTAGIOUS PLEURO-PNEUMONIA.—The letter which we print below, from our esteemed friend, Dr. J. W. Gadsden, was received as we were about leaving the city for a short vacation, and after the manuscript for our September issue had been completed. This must be our excuse for any delay in acknowledging its receipt, and in presenting it to our readers. We hope that Dr. Gadsden will not suspect us of feeling indifferent to his request, and that knowing our appreciation of the importance of the subject upon which he is asking for information, he may find in the hands of our colleagues all the documents necessary to help him to the solution of a question which is not only of great importance to

us veterinarians, but which is of such consequence in its bearings upon the subject in a national aspect. The letter reads thus:

PHILADELPHIA, August 12th, 1893.

Prof. A. Liautard, M.D., etc.:

MY DEAR DOCTOR.—I am desirous of securing information as to whether "contagious pleuro-pneumonia in cattle still exists in any part of the United States," and would be greatly obliged if you would advise me if there have been any cases of the disease in your vicinity, or which have come under your notice during the past year. If there have been any, I should like to have the exact location, number of animals affected, and any facts in relation to the outbreak which you deem of interest.

I have been requested to prepare a paper on this subject to be read at the First International Veterinary Congress of America, to be held in Chicago, October 16th to 20th, and desire to be correct as to facts; and any information you send me will be considered strictly confidential.

Yours respectfully,

J. W. GADSDEN, V.S.

ORIGINAL ARTICLES.

SCOURING IN CALVES.

By JOHN M. PARKER, D.V.M., Boston, Mass.

(Read before the Massachusetts Veterinary Association, April, 1893).

Diarrhœal diseases in calves may be roughly divided into simple dyspeptic diarrhœa and "acute mycotic diarrhœa, or diarrhœa of bacterial origin. The difference between the two is rather one of degree than one of kind. In the former the symptoms are not so severe; it is rarely fatal, and the treatment is practically the same as in the more acute form, which is the form I shall more particularly consider.

Within the last ten years numerous investigators have been at work on the ætiology of diarrhœal diseases, but so far no very positive conclusions have been reached. It appears to be generally accepted, however, that diarrheal diseases are generally due to bacteria or their products.

It is now known that bacteria are present in the normal intestine in enormous quantity, and, further, that different kinds of food favor the growth of different kinds of bacteria. In infants or animals fed on milk diet, for example, there are two kinds of bacteria that are always present; one of these,

the "bacterium lactis ærogenis," is only present during milk diet; "it has not been found in the meconium, nor after a flesh diet, and it is found principally in the upper portion of the intestinal tract." As pointed out by Escherick, "its vital activity in the intestine depends on the presence of milk-sugar, and its extension there corresponds with that of this substance."

Milk-sugar is completely absorbed in the stomach and small intestine, and is not found normally in the large intestine. At the time of milk digestion the "bacterium lactis ærogenis" is found in great quantity in the upper part of the small intestine, and in proportion to the absorption of milk-sugar it becomes scarce, diminishing in numbers; in the colon and in the fæces comparatively few individuals of the species are found." (Keating, p. 180).

Baginsky has demonstrated by experiment that the "bacterium lactis ærogenis" has an extremely active development, and when cultures are made along with other pathogenic bacteria in suitable culture media the "bacterium lactis ærogenis" grows so rapidly that it prevents and retards the growth of the other bacteria.

These experiments led him to the opinion that the "bacterium," if placed under favorable conditions, may prevent the growth of other pathogenic organisms in the intestine, and that in the acid fermentation of milk-sugar caused by the "bacteria lactis ærogenis," we have a remedy which serves in the infant's organism to protect the intestinal wall from pathogenic bacteria. But when this fermentation exceeds a certain degree, which may happen in abnormal conditions of the intestine, it destroys the "bacterium lactis ærogenis," and thus lays the foundation for pathogenic processes of various kinds.—(Keating, p. 185). For example, if from some temporary cause there is increased peristalsis or an intestinal catarrh, or if from any cause there is an interference with the normal process of digestion, the temporary trouble may be kept up and aggravated by the presence of the micro-organisms which have gained the ascendency through the destruction of the normal bacterium.

These micro-organisms "may have begun their work outside the body by developing in the milk, and so causing abnormal products of decomposition or fermentation, possibly poisonous ptomaines."

These abnormal products of decomposition or poisonous ptomaines affect principally the nervous centers and cause the severe nervous depression and heart failure usually seen in these cases.

Baruch also believes "that the summer diarrhœa of infants is chiefly, though not solely, due to the ingestion of micro-organisms, which create in the gastro-intestinal tract conditions analogous to those found in wounds, to which septic material has had access." He further argues that unsanitary conditions, poverty, filth, etc., are entitled to be placed only among the predisposing causes. The indigestibility of casein of cows' milk by artificially fed children is of no importance, since in winter this is borne without serious consequences." He concludes that the kind of food, if it be reasonably constructed, has little to do with producing diarrhœal disease, *provided the access of micro-organisms in its preparation can be prevented.*

Rachford also holds: First.—"That the chief, if not the only, direct cause of 'summer complaint' is abnormal intestinal fermentations of food stuffs. These are always caused by bacteria.

Second.—"At present we are unable to make an exact ætiological classification of these diseases, but it is probably true that there are quite a number of pathogenic bacteria, each capable of producing definite changes in the food which will cause characteristic symptoms.

Third.—"The disease being of bacterial origin it is necessarily infectious. It is probable that not all the diseases embraced under the general term are equally infectious."

This writer believes that bacteria may cause disease in any one of three ways:

First.—"By interfering with the growth and function of bacteria normal to the intestine. In this way bacteria which do not produce poisonous ptomaines or irritating products

may cause digestive derangements. It is quite likely that this form of disease may act as a predisposing cause to other forms.

Second.—"By formation of irritating materials during the fermentation of food stuffs in the intestine, especially in acid fermentation.

Third.—"By producing ptomaines which act as physiological poisons." (Universal Med. Sciences, Vol. 1, 1889).

All investigators seem unanimously to be of the opinion that bacteria, either directly or indirectly, are the cause of this class of disease.

There seems to be a tendency, however, to lay too much stress on the bacterial origin of the disease, and forget that diet and constitution and the sanitary and hygienic surroundings have a great deal to do with its fatal character. As showing the influence of diet on the prevalence of diarrhœal diseases in children, out of 1,000 cases recorded by Hope, 30 were fed by the breast exclusively; of 602 fatal cases, recorded by Meineot, 24; and of 34 fatal cases, recorded by Ballard, 7 were fed by the breast exclusively, making a total of 1,943 fatal cases, of which but about three per cent. had the breast exclusively.

"These facts," says Keating, "speak volumes. They show that the manner of feeding is one of the most important factors in the production of diarrhœa. As long as children are nursed exclusively they suffer but little from diarrhœal disease, but in the same class of children as soon as the age is reached when other food is added we find a very marked increase in its frequency. Children among the poor in tenements enjoy immunity from intestinal disease just in proportion as they are nursed at the breast and just so long as they are so, but as soon as artificial feeding is begun diarrhœal diseases begin to be prevalent." (Keating, p. 64).

These remarks apply equally well to calves. In the summer of 1890 and 1891 I treated from forty-five to fifty cases of scouring in calves. The calves averaged from one to three months old when attacked. They were usually allowed to suck until three or four weeks old, when they were hand-fed

till they were three or four months, at which time, if the season of the year was suitable, they were turned out to pasture. With seven exceptions all the cases occurred between the time of weaning and turning out to pasture, and with three exceptions all the cases occurred during the summer months. Six cases occurred while the calf was suckling (morning and night); over forty while the calves were confined in pens and were being hand-fed, and only one after the calves were turned out to pasture.

On one occasion calf after calf was attacked with scouring, two or three new cases occurring each day until there were upwards of a dozen calves sick at one time. Three had died, and nothing seemed to do any good until on close investigation we found that great numbers of the squashes, which were being fed the cows, were decayed. Their use was discontinued, and the scouring rapidly disappeared. That this was the cause of the trouble was proved by the fact that some weeks later the foreman, wishing to use up the remainder of the squashes to get them out of the way, fed them to the cows, with the result that more of the calves were attacked with the old trouble.

Injudicious feeding then of cow or calf, allowing the calf to overgorge itself, irregular feeding, feeding milk too hot or too cold, all unfavorable hygienic conditions, such as hot, close weather, overcrowding, bad ventilation, want of sunlight, want of bedding, any one of these or a combination of them tend to produce an unhealthy condition of the calf and favor chronic indigestion.

"And this chronic dyspepsia or indigestion," says Keating, "is more important than all other factors as a predisposing cause of diarrhœal disease." Anything that lowers the vitality of the animal increases its liability to disease. On the other hand, "healthy digestion and perfect absorption are the great obstacles to the development of new varieties of bacteria," for "although new varieties of bacteria are being introduced all the time they fail to develop because their number is small or the conditions favorable to their development are wanting."

Suckling calves escape because they are healthier, because their digestive organs have not been abused, and because their milk is sweet and pure and free from bacteria. While on the other hand, calves brought up by hand are usually more or less troubled with chronic indigestion from one or other of the causes already mentioned.

The pails and milking utensils and receptacles for milk are not usually so pure and clean as they ought to be, and partly for that reason, and in consequence of the hot weather in summer, the milk often swarms with germ life, and is sour and acid from fermentation having already commenced, so that when taken into the stomach, especially if taken in large quantity, and in hot weather when the system is enervated, and there is a low state of vitality, the digestive power is to a great extent lost, food will ferment and produce irritating acids and ptomaines, which in turn produce the symptoms which we know as "scouring in calves."

Symptoms.—The symptoms of acute mycotic diarrhœa in calves are well marked. The onset is usually sudden. One of the first symptoms noticed is usually the want of appetite. The calf refuses food entirely; the tail and buttocks are noticed to be foul and covered with a dirty yellowish discharge; its eyes appear sunken; there is often a discharge from both nose and eyes; the nose is usually dry; it rapidly loses flesh and strength; it lies constantly in a semi-comatose condition with its eyes wide open, and it has not even vitality to brush off the flies that are attracted by the sour-smelling evacuation; if made to rise it will stagger and appear weak; the abdominal walls appear flat and collapsed; its extremities are cold; its muscles become flabby; sometimes when it has been lying with its head round to its side, when made to move the muscles of the neck will have contracted so that it is unable to straighten its neck; it keeps continually pressing its teeth against its gums, causing a peculiar rubbing noise; the pulse is rapid and weak, and hard to count; the temperature is usually elevated.

This disease runs a particularly rapid course, the severe symptoms seldom lasting over forty-eight hours, and in some

cases it reaches a fatal termination in from eight to ten hours. Three cases have come under my notice where the calves were seemingly well in the evening and were found dead the following morning.

In simple dyspeptic diarrhœa, while the symptoms may sometimes develop as rapidly, they are yet not so severe; there is not the sunken appearance of the eyes; the calf does not lie in the same semi-comatose condition; there is not the same evidence of nervous depression; but it appears brighter, pays more attention to surrounding objects, there is no rise in the temperature, and the appetite is not entirely gone.

The *prognosis* in all diarrhœal diseases should be guarded if the symptoms are severe; if the patient lies in a comatose condition, with no appetite, sunken eyes and profuse diarrhœa, especially if the hygienic conditions are poor, then the prognosis is unfavorable; if, on the contrary, the appetite is not altogether gone, if the eyes are bright, and the hygienic conditions and sanitary surroundings are good, the prognosis is much more favorable.

Post-mortem Appearances.—In making autopsies on calves dying from this disease one cannot help noticing the marked absence of lesions when compared with the great severity of the symptoms. This is fully accounted for, however, when we remember that the process is not inflammatory, but through acute fermentation in the gastro-intestinal tract a poisonous substance is produced, which affects primarily the nerve centers, causing nervous depression and heart failure. If this process were continued for a sufficient length of time inflammatory changes would take place; as it is, death usually occurs before the inflammatory lesions are sufficiently well marked to be noticeable to the naked eye.

In ten post-mortem examinations which I have made in calves dying from "acute mycotic diarrhœa," the examinations were held within a few hours after death, and the appearances observed were in all cases practically the same.

The first thing that strikes one in looking at the body is the rapidity with which emaciation has gone on, and the completely collapsed condition of the abdominal walls. The eyes are sunken; there is discharge from both eyes and nose; the

tail is invariably soiled; on making an incision the first point to be noticed is the pale white character of the muscles and intestines; the lungs appear normal except for hypostatic congestion; the heart usually contains a quantity of dark-colored blood in both sides; the heart muscles are flabby and soft.

The intestines contain dirty white liquid consisting of undigested food and particles of curdled milk. In most instances the mucous membrane is soft and easily separated, but it must be remembered that it is usually hot weather and the post-mortem changes are very rapid. The stomach usually contains a quantity of frothy undigested food, liquid food; the mucous membranes are all pale in color and have a washed out appearance.

Other abdominal organs appear normal, notwithstanding the absence of pathological changes; however, the conditions would not be easily mistaken. The flabby condition of the muscles, the collapsed condition of the abdominal walls, the dirty condition of the buttocks, sunken eyes, paleness of intestinal organs, all tell a tale that would enable one to recognize a case, even if there was no history to guide him.

Treatment.—Scouring in calves is an exceedingly indefinite term. It seems to include all cases of simple dyspeptic diarrhœa, acute mycotic diarrhœa, and even the more chronic forms take shelter under its wing; and in considering the treatment to be adopted, while the general plan of treatment is the same in all, yet the success attending treatment in the more severe forms is usually far from encouraging. The essential points to be remembered in treating a case of acute mycotic diarrhœa are, first and foremost, to sustain and strengthen the heart and system generally, to allay nervous irritation, and to stop diarrhœal discharges.

The treatment with which I have had the greatest success is to clear out the gastro-intestinal tract with laxative medicine (nothing answers the purpose better than castor oil, ℥i-℥iss), to stop all milk diet for from twelve to forty-eight hours, and to support the system with brandy and eggs and oatmeal water. The brandy and water should be used freely. Opium is a good heart-tonic, and at the same time it diminishes the

excessive hyper-peristaltic movements of the bowels. Probably Dover's powder (80 xx-xxx) is as good a form as any in which it can be given. Where there is much stupor chlorohydral or ipecac is preferable to opium. Sometimes suppositories of opium are of great value.

It should always be borne in mind that the simpler the medicinal treatment the better. Laxative medicine clears the intestinal tract of all irritating substances and products of fermentation, allowing it to begin afresh, "so to speak." After from twenty-four to forty-eight hours have elapsed, probably the best results are obtained by allowing the calf to suck a little, if it will. If it refuses then a very little diluted sterilized milk (not more than one-half pint at a time) may be given with the brandy and eggs and some preparation of opium.

Medicinal treatment, however, is of secondary importance to dietetic and hygienic treatment; good, pure air, and plenty of it, is an absolute necessity; nothing is more depressing, especially in summer weather, than for a sick animal to be shut up in a hot, close pen, with little light or air; and when we remember that these are cases of "poisoning, with great nervous depression of the heart and system generally, and that we are not treating intestinal catarrh, nor intestinal inflammation, although intestinal inflammation is one of the results that are likely to follow if the patient survives the first overwhelming shock of the poison," the necessity for pure air and good light and clean surroundings is still further emphasized. During convalescence too much care cannot be taken; if the calf is very young it should be allowed to suck a cow that has lately come in; if that is impossible, then it should be fed scalded milk for some time, and the greatest care should be taken with the surrounding hygienic conditions.

Diarrhœal diseases are to a great extent preventable; if "scouring" is due to the introduction of micro-organisms, and if conditions favoring the growth of micro-organisms favor the development of the disease, then it follows as a natural consequence that the removal of these conditions will be followed by a corresponding decrease in the prevalence of the disease. It is most important then that the milk should be kept in as cool a place as possible, the utensils ought to be

scalded both before and after using (in consequence of the difficulty in keeping them clean, wooden pails should not be used). The milker's hands and the udder should both be washed before milking, and in every way an endeavor should be made to keep the milk sweet and fresh and *free from bacteria.*

Further, the calves should be kept in as strong and healthy a condition as possible; the pens in which they are kept should have light and plenty of fresh air; these are just as essential to the healthy development of animal life as of plant life. Dry bedding, and plenty of it, is another item that is too often neglected; the calf-pens are usually in a dirty, filthy condition; on the average farm they are not cleaned out till a wet day comes round, when the hired man does odd jobs around the buildings. Nothing is worse for young stock of any kind than to be compelled to lie in their own wet and filth. Another important matter is the water supply; calves will drink a large quantity of water if they have free access to it, but when the wells are situated in or near the barnyard more or less of the surface drainage must find its way into the well and contaminate the water supply.

In conclusion, the whole sum and substance of prevention is hygiene. Hygiene is of paramount importance; unfortunately, however, farmers do not realize the importance of the subject, and until they do "scouring in calves" will remain as much a mystery and a source of loss to the farmer as it is to-day.

THE HOOF AND ITS CULTURE.

By Dr. Williamson Bryden, V.S., Boston, Mass.

(Read before the Massachusetts Veterinary Medical Association, June, 1893.)

Permit me to apologize to you for again trespassing on your time to call attention to the subject of the "Hoof and its Culture."

The study of the horse's hoof and limbs, as most of you are aware, is not altogether new to me, for it is now almost twenty years since I first determined, after much hesitation,

to send to the *Veterinarian* a little article claiming that *bone spavin and some other diseases and defects of the horse's limbs were caused by defective hoofs.* It was an event I will long remember, both for the anxiety it gave me, first as to whether it would be considered worth publishing or be thrown into the waste basket, and second for the satisfaction and encouragement its appearance in print gave me.

For some three years previous I had mostly practiced in accordance with the text-books and lectures at college until convinced, not only of their error, but of the necessity for some system that must recognize the hoof, when deranged or defective, as the essential cause of most of the blemishes and diseases of the feet and limbs of the horse. Such a system being the only one that can ever relieve us from the confusion we are in on the subjects of soundness, heredity, etc., or help us out of the ruts such eminent writers as Percival and a few others led the profession into, until their theories and practices have become to the veterinary surgeon like a creed, which it would be audacity to question. It makes no difference how much the modern practitioner has failed to obtain the results promised or expected from the firing iron, the frog seton, tenotomy, neurotomy, and the whole array of other operations endorsed as so-called remedies by them, whether applied to the cause or the result.

My experiences, coupled with the success attending a rational treatment that discriminates between causes and results, compelled me to condemn and abandon the old methods, and advocate and practice something in harmony with a more consistent philosophy. The impulse to contribute something on this subject became so irresistible that it has ever since been my greatest delight not only to make of the horse's hoof a careful study, but to think, to practice, and try to impart to others whatever might be found beneficial to the profession, or lessen the sufferings of our humble patients.

It can now be demonstrated beyond a question that in such diseases as bone spavin, bog spavin, curb, splint, ringbones, etc., the hoof can be guided in a right as easily as in a wrong direction with complete success; so that such blemishes

and diseases can be instantly arrested and be made to gradually vanish just as they came, being due far more to afterbirth environment and mismanagement of the hoofs than to heredity. This is so certain that in nearly every case a cure can be warranted. The same may be said of navicular disease and the various forms of laminitis, side-bones, and enlarged cartilages. They are entirely curable if taken in time, even to an advanced stage; the age of the animal, the length of time the defects have existed, demanding merely more time for readjustment and repair. Springhalt, paddling, interfering, overreaching, hitching, pacing, traveling one-sided, tripping, stumbling, etc., all depend upon hoof depravity. So-called scratches, scurfy and horny eruptions on the legs, also depend on the disturbed state of the skin of the pasterns and ankles from irritation, interrupted circulation and embarrassed functions, caused by a contracted or unthrifty hoof, the result being frequently the transplanting of the horn and hair elements, as well as cutaneous and sub-cutaneous tissues; all these again become normal after the hoof is properly opened up. Tissue metamorphosis in the soliped, I predict, will yet become a subject of the highest interest to the student of comparative medicine; first, on account of a difference from orthopœdics in human surgery; and second, the fact such changes are probably as much physiological as pathological, the rectification of imperfect horse's limbs being very different from what is required in human limbs.

The tenacity with which veterinary surgeons will adhere to old mysterious notions and traditions even after the failures and disappointments that have ever attended their practice, of this branch of the profession, and for so many years, can only be explained by characterizing their whole system of treatment as "temporizing expedients," mostly tricks and patchwork; that their patience was not exhausted long ago, nor their veterinary genius stimulated, is hardly creditable either to their ingenuity or their enterprise. Medical men, some of them eminent, to whom these features of the subject (the ætiology of tissue changes) have been submitted, pronounce them to be in entire harmony with sound medical

philosophy, yet the veterinary surgeon either cannot or will not try to comprehend it, consequently they blunder along, believing in, and practicing what never could be demonstrated by them, and causing a heavy average loss of animals every year, which might just as well be saved.

No one has suffered from the mistakes of the veterinary surgeon more than the horseshoer, unless it be the poor horse. Their interference with the technical work of horse-shoeing has done more to confuse the smith and keep horse-shoeing backward than it has ever benefitted the art. When one reflects on the various shoes recommended by the ordinary writer on horse-shoeing, such as high-heeled shoes and low-heeled shoes, tips and three-quarter shoes, bar shoes and jointed shoes, Charlier, La Fosse, so-called Goodenough, and those of a lot of others whose notions of what the hoof's requirements demand are as various as they are wrong, their treatment of the whole subject is so ridiculous that it would be picturesque, were it not for the sufferings the poor animals have been compelled to endure on account of such equivocal teachings.

The sacredness, too, with which the frog and the bars, the sole and the wall have ever been regarded by these gentlemen, especially the veterinarians, is far from being creditable to their surgical instincts. The horseshoer is not allowed by them to use either a rasp or a knife, excepting in the most inefficient manner, and the sight of a good buttress would throw the modern writer of veterinary works and text-books, and professor of horse-shoeing, into hysterics.

Hoof culture is a benign process or system, no devil is to be cast out, consequently no sacrifice is necessary, and no torture is required.

I won't detain you with a detailed history of the early development of the hoof of the young foal, but will simply remark that in northern climates, where the winters are long and the ground liable to be frozen four or five months, May and June are probably the best months for the young animal to be born in; the grass has then come to stimulate the milk-giving functions, the ground is soft, furnishing the best footing for the foal, and also for the mare, especially if she has been kept in a barn or stable on a dry floor all winter.

Begin early to watch the little hoofs. If they grow irregularly or become foul, or the joints do not straighten properly, remember that the hoof is always reproducing itself, and if trimmed properly it can be guided to a renewed and more perfect growth, which always influences the limbs favorably, just as happens when the gardener prunes and trims and fertilizes trees, shrubs and plants. This applies to the cultivation and management of the hoof, especially in a state of domestication, from birth to maturity, and after as well.

In suitable surroundings an unembarrassed circulation can easily be maintained, so that the danger from hoof depravities becomes trifling, either from defectively, irregularly or unsymmetrically acquired development. When the gait is faulty, it is always due to the form and quality of the "horny box," and can be corrected at once. It is of great importance, too, to watch the way his hoofs are placed on the ground; for example, should one foot be placed on the toe and the other square on the sole, it is evident that the two limbs will not organize alike—walking on the toe indicates that something about the heel makes it more comfortable for him to do this. But after his heel is all right, it may still remain as a habit and cannot be neglected with impunity. One or two hoofs sometimes grow less thrifty than the others, and one or more may grow deficient in form and quality. This happens to both male and female, but mostly to young animals reserved for stallions, being deprived of natural exercise, and their hoofs not getting proper tear and wear in suitable pasture—a matter of great importance—they acquire what are known as pin-toes or stallion-toes, and these require much care; yet the worst cases can be changed in from eight months to a year, into feet and limbs that are perfect. It is of great importance, too, that the character of the deformities and blemishes be early recognized and corrected, because a part like the limb or hoof that suffers from perverted or arrested growth of a part, for a year or two before maturity, and during its growing period, is more liable to leave some trace than are adverse changes occurring after maturity.

As has already been said, the hoof is a part that is always

reproducing itself, and consequently becomes of importance, first, to trim and remove any obstacle to the new growth, such as the old contracted wall, sole and frog, which only crowds the lamina, arrests circulation and hinders repair; second, employ suitable remedies, especially such as will encourage the new growth to repair.

The diseases of horses' limbs must be divided into at least two classes:

1. What may be called physio-pathological changes; these include such diseases as spavins of all kinds, curbs, splints, springhalt, navicular disease, diseases of the lamina, so-called corns, quittors, etc., diseases and changes peculiar to the soliped species—all entirely curable, unless too long neglected, or improperly treated. They are always the result of hoof depravity, consequently impossible of successful treatment until the cause is removed by the renewed growth of horn, for then only can the derelict limb or the parts enclosed in the "horny box" ever be repaired. To treat such defects locally or directly can only fail, and the case ends in disappointment.

2. What may be regarded as the other class are such diseases and accidents as may affect any species of animals, and are generally amenable to direct or local treatment. A sharp distinction must be made between these two classes, for here is where the most signal failures to comprehend this subject and treat the cases consistently and successfully have occurred. In what has just been described as the physio-pathalogical class, the following instructions must guide us in treatment.

1st. Prepare the foot by softening the hoof, then reduce the wall all it will bear, rasp the wall thin, unless the animal is to be used, when enough must be left to nail the shoes to, the toe and the heels, however, must be well thinned, and so must the sole. If the bars are bent they must be thinned out; but the heel must also be weakened to correspond with the bar, for if this is not done it is liable to close. If the bar is straight, however, it may be left as a brace to force the quarter out when the heel-wall opposed to it is weakened.

This is better than tricks with spreaders, which are seldom reliable.

When animals have been long affected and must either go to pasture or remain idle in the stable during treatment, reduce as much as possible wall, sole and frog. Do not make the feet tender, neither is it necessary to cause them pain or draw blood, even in the worst cases; be sure, however, to keep the hoofs soft, and use on soft ground.

A great mistake has always been made by paring, for example, the sole, and leaving the wall, the frog and the bars untouched; every part must be reduced in proper proportion, and the more thoroughly it is done the better, for then it immediately starts on its reparative course. Mechanical interferences with the circulation, crowded structures like the defective substance, horny lamina, and other transformed and degraded tissues, such as the unthrifty horn, which are a continual source of disturbance to the extremities, but can be so easily relieved that pernicious growths like enlarged cartilages, etc., are arrested and gradually diminish until they become almost as natural as if they had never been involved in one of the adverse changes I have characterized as a secondary or physio-pathological transformation, a stage beyond the so-called physiological tissue changes, whether associated with atrophy or hypertrophy.

Nothing impels the advanced student of hoof culture to recognize its importance more than the benign methods demanded, and the success attending its treatment, both when the hoof itself is diseased and when it is the cause of defects and diseases on a remote part of the limb or body. I hardly dare to remark that in all probability defective hoofs have much to do with other defects, such as roaring, wind sucking, cribbing, weaving, atrophied muscles, fistulous withers, poll evil, etc. If this subject had first been announced by some French or German professor it might have been considered favorably, but emanating from one near home, it cannot be considered in less than a generation, and even then the veterinary surgeons who practice hoof culture can be countcd on the fingers of one hand. They cannot grasp the principle.

The fact is, veterinary pathologists have hardly hinted to the hoof as being the cause of diseases appearing elsewhere on the horse's limbs or body, yet they imagined that they easily understood how bone spavin and splints might be caused by a blow or some mysterious diathesis. To discriminate between the ætiology of changes caused by a blow, and the ætiology of the blemishes, transformations and tissue changes peculiar to the horse's feet and legs, never seems to have entered their heads.

Old maxims, mysterious traditions, and "fake" practices and notions handed down from remote periods, the veterinary pathologist could always explain to the satisfaction of the profession, such simple faith has ever been accorded their teachings that they have ever been allowed to pass unquestioned.

This applies especially to the study of the locomotive organs of the horse and their treatment, which is still so coarse and inconsistent that it is hardly creditable to the veterinary profession in the year 1893.

Again appealing to you to take up this glorious subject, and apologizing for any censure I may have unjustly implied, for I am used to being censured and even sneered at, and have long and patiently submitted to the taunts and criticisms of both horsemen and veterinarians. They have pained me much.

In closing this article I sincerely hope to find hoof culture, before long, one of our most interesting and popular professional topics, studied not only by members of the veterinary profession, but by the horseshoer and the farmer, the farrier and the trainer, the gentlemen of leisure and the owner. I also sincerely hope to see a horse-shoeing department in every college, liberally endowed, and showering blessings on our long suffering and much abused friend, the horse.

BOVINE TUBERCULOSIS.

By JOHN M. PARKER, D.V.M., Boston, Mass.

(Read before the Haverhill Medical Club, April, 1893).

I am pleased to have the opportunity of bringing the subject of bovine tuberculosis before you, not because I have anything particularly new or original to present to you, but because I wish to call your attention especially to the sanitary and hygienic aspects of the subject, which have been too much neglected.

As you are aware, all domestic animals are more or less subject to tuberculosis. Dairy cattle, however, in consequence of their mode of life, and because of the heavy drain on their system through excessive breeding and milking, are more predisposed than any other of the domestic animals Of the different breeds of cattle the delicate, highly bred Jersey is probably the most susceptible, while the hardy native breeds are most exempt. The early physical diagnosis of bovine tuberculosis is difficult; the symptoms are very meager, and, in fact, in some cases even when the disease is well advanced, there is seemingly little alteration in the health of the animal.

For example, in that form of tuberculosis known as "perlsucht," or "pearl disease," of cattle, where the serous membranes are covered with the peculiar characteristic nodular masses, the animal may be in a seemingly healthy condition. At other times the only symptoms observable may be enlargement or tumefaction of the external lymphatic glands, with possibly tubercular nastitis, in which condition there may be a characteristic hard and knotted condition of the udder, which is devoid of sensibility, and is non-secretive, or there may be a "diffuse and uniform enlargement and induration," with "functional activity to a greater or less degree." These symptoms, however, would be sufficient, especially with a previous history of tuberculosis in the herd, to condemn the animal.

Again, there may be indigestion and persistent tympanitis from the enlarged bronchial glands pressing in the œsopha

gus, and so mechanically preventing regurgitation of food or gas from the stomach. Persistent œstrum or heat, with barrenness, especially when there is a harsh, unthrifty condition of the coat and a general loss of condition, must be looked upon with suspicion. Tubercular arthritis is also common in dairy cattle.

The most common form of tuberculosis, however, is where there is an almost characteristic chronic cough; on exertion the breathing becomes hurried and more labored, and is usually accompanied or followed by the cough. Auscultation and percussion show a more or less diseased condition of the lungs. There is usually more or less marked tumefaction of one or more of the superficial lymphatic glands. There is often scouring, the buttocks being in a dirty state. The temperature may or may not be altered, and the pulse but little affected.

The only positive diagnostic symptom is the finding of the bacilli in either the nasal or vaginal discharges, pharyngeal mucus or the milk. The microscopical examination of the nasal discharge, when present, usually yields the best results. The only other methods in use as aids to diagnosis are the inoculation of the suspected animal with Koch's tuberculin and the inoculation of rabbits or guinea-pigs with either discharge or milk.

The first of these methods (Koch's tuberculin) has been extensively used and highly recommended by both European and American investigators for diagnostic purposes, and while it has not yet been recognized as an infallible diagnostic agent, the results have been sufficiently encouraging to warrant further trial and investigation.

The second of these methods, the inoculation of rabbits or guinea-pigs with the milk or the discharge from a suspected animal, will probably never be brought into general use by the ordinary practitioner. In a suspicious case, however, it is often of the greatest value as an aid to diagnosis.

Ætiology. — As you are aware, the immediate cause of bovine tuberculosis is the same as in the human family (viz., Koch's bacilli). The bacilli do not always present the same

appearance, however, certain "morphological differences are found," and "under different circumstances and within limits, the morphology of the tubercle bacilli varies with its environments." Thus tubercle bacilli from the nodulus of "perlsucht" are generally shorter and thicker than those from the human being. Those found in cows' milk again approach more nearly to the familiar rod-shaped bacilli found in the human sputa; but while minute morphological differences can be detected in the tubercle bacilli of different species of animals, the general characters and characteristics of staining and culture are the same in them all.

In considering the ætiology of bovine tuberculosis, there are two natural groupings into which the methods of infection can be divided. The first and most important is by the introduction of the bacilli through the respiratory tract. The second, the direct introduction of the germ through congenital or hereditary transmission, or through eating or drinking tuberculous meat or milk.

In considering the first group it is necessary to take a generally broad view of the subject, and include all sources from which the tubercle bacilli can gain access to the atmosphere, whether that source is a consumptive human being or a tubercular cow matters not. Once they gain entrance to the atmosphere, from whatever source they come, they are equally dangerous.

The two most important means by which the bacilli can gain admittance to the atmosphere are: Fi st, by the expectorations of consumptives. Second, by the nasal discharge of diseased animals.

In reviewing the work on the subject of phthisical expectorations, in the Manual of Medical Science for 1890, Whitaker says:

"The work of the year has established almost to universal conviction that pulmonary tuberculosis is caused exclusively by inhalation of dried sputum. This, the original postula of Koch, met its conclusive proof in the studies of Cornet. 'It is not,' he says, 'the breath of the consumptive which is dangerous, but singly and alone the inhalation of the dried

sputum, which is mixed with the dust of the floor.' 'The whole question of infection,' he goes on to say, 'has in the past year narrowed itself down to infection by sputum and by milk, and this fact may be regarded as the acquisition of the year.'" (Manual of Med. Sc., p. 190).

We can easily understand, therefore, how a consumptive person, having charge of a dairy herd, must become a source of danger to that herd, and might become a source of greater danger to a healthy herd than even the introduction of a tuberculous animal.

An instance was related to me some time ago by one of the State Board of Cattle Commissioners, having a direct bearing on this subject. In his capacity as State Inspector he was called to see a young heifer which was ailing. There was no previous history of disease in the herd; all the animals so far as could be traced were perfectly healthy; no new animals had been brought in; the bull used for service was a young, healthy animal with no trace of disease, and yet unmistakable symptoms of tuberculosis began to develop in this young heifer. (These on post-mortem examination proved to be tuberculosis).

Here was something of a puzzle, which was easily explained when it appeared on conversation that one of the attendants was far gone with acute phthisis. And I believe if this matter was carefully investigated, like causes would be found more common than is generally supposed.

The second source of danger, viz., the nasal discharge of diseased animals is analgous to the expectorations of human consumptives. Cattle do not actually expectorate, but we must remember their bodies are not in the upright position of a human being; their heads are held lower, and consequently any discharge from the lungs runs freely from the nasal passages; in this way the manger and woodwork become covered with the discharge, which dries, and subsequently particles, becoming detached, mix with the dust and dirt, and become a source of danger to the neighboring animals.

The second group of ways by which the bacilli may gain entrance to the animal body, is by direct infection through

eating or drinking tuberculous meat or milk, or by direct hereditary transmission. In the matter of diseased meat, the divergence of opinion on the subject is peculiar.

Bollinger, Kastron, Nocard and others have come to the conclusion "that the flesh of tuberculous animals is only exceptionally dangerous, and even in these exceptional cases it is dangerous only in a slight degree." Other observers hold the opposite opinion, and at the Congress for the Study of Tuberculosis, held in France in 1889, and at the Congress of Hygiene and Demography, held in London in 1890, resolutions were passed recommending absolute seizure of meat wherever there was any trace of disease in the carcass. Notwithstanding their action in the matter, however, there is a general tendency both in Europe and in this country to take a more moderate view, and when lesions are found to be localized and the flesh in good condition the carcass is not generally condemned.

With regard to milk from tuberculous animals, the experiments of Ernst and Peters, Hirschberger and others have demonstrated the fact that milk from tuberculous cows is dangerous, even when the udder is perfectly healthy. The experiments of Hirschberger, which are exceedingly interesting, show "that the danger varies at different times, being present when spores from some focus of infection happened to be absorbed into the blood current and were excreted by the milk." These experiments also showed that the milk of tuberculous cows is dangerous in fifty-five per cent. of cases.

Bollinger, however, showed that the virulence was to a great extent lost when the milk was mixed with that of healthy cows. Negative results being obtained in one case "with a dilution of one in forty, in another, one in fifty, in another, one in one hundred." "Milk is rendered less dangerous by admixture with other milk," and while "the advancing disease in one cow increases the virulence of its milk, dilution with milk of other cows lessens the virulence." (Manual of Medical Science, 1890, P. A. S.).

So that while there is danger in using milk from tuberculous cows, the actual danger is not so great as one might sup-

pose if the results of laboratory experiments were only taken into consideration. The danger is principally confined to people having one cow for family use, or to children being fed with milk from a cow reserved for that purpose.

In considering the direct hereditary transmission of tuberculosis, I would call your attention to a case reported in the "Journal of Comparative Pathology" (March, 1892). The article goes on to say "that in the body of a man who died of decimated tuberculosis of the pharynx, larynx, lungs, intestine, kidneys, prostate and rectum, the vesiculæ seminales were full of semen, which were found to be swarming with tubercle bacilli. The other genito-urinary organs were healthy." (Br. Med. Jour.).

This case is peculiarly interesting and instructive, and following in the same line, McFadyean reports a case of congenital tuberculosis in a calf five days old in which several of the lymphatic glands "were enlarged to the size of a large nut, and caseous toward the center. Some small nodules, the size of a pea, were seated in the liver substance itself, and these were also in a state of caseous degeneration; and on staining cover-glass preparations there was no difficulty in discovering tubercle bacilli."

That this mode of transmission of tuberculosis is uncommon, not to say rare, is shown by the fact that up to the present time there have been observed only six cases of indubitable congenital tuberculosis in the calf, that is to say, cases in which the possibility of the disease, having had an extra uterine origin, was excluded, and in which the exact nature of the lesions was established by the discovery of Koch's bacilli in them. In three of these cases the lesions were discovered in the fœtum infant; in the fourth, the calf was dead-born, and in the other two the animal was under fourteen days old. The writer goes on to say, "it is probably not wide of the mark to estimate the tuberculosis among dairy cows at three per cent., and yet we know from careful statistics, furnished by the large continental abattoirs, that the proportion of tuberculosis among calves under one month old does not exceed 1 in 70,000."

This would tend to show that direct transmission of tuberculosis from parent to offspring is rare. As a rule, the offspring of tuberculous parents is weak and predisposed to disease in consequence of the want of constitutional vigor to resist it. In the majority of cases tuberculosis is not directly transmitted; there is simply a constitutional weakness and predisposition, perhaps not especially to tuberculosis but to disease in general.

Among the many predisposing causes of tuberculosis I would class anything that lowers or tends to lower the vitality of the system; anything that decreases or tends to decrease the disease-resisting powers which all animals possess to a high degree; and hereditary predisposition is probably one of the foremost of these causes, because for generations cattle have been bred for their milk supply, with a total and suicidal disregard for the general health and strength of the animal.

Among the causes that have tended to produce this peculiar constitutional predisposition of dairy cattle probably the most important are confinement and want of exercise, poor ventilation and bad sanitary condition generally, with injudicious feeding and breeding.

A German journal states "that in Canton Freiburg in 1890, out of 14,142 housed animals there were 249 deaths, and 8.7 of these deaths were due to tuberculosis, while in the district in which the cattle were fed out of doors, the deaths from tuberculosis amounted to only three per cent. of the total losses; that is to say in the districts where the animals were almost constantly housed and fed unnaturally, the deaths were two and one-half times greater than where the animals were kept out of doors and fed naturally."

This is only what one would expect, as it is in close, ill-ventilated barns that the bacilli would naturally collect; and apparently no better proof of this could be found than the remarkable results obtained through improvement in ventilation in the French cavalry stables.

After sanitary measures were adopted, cases in glanders in the cavalry horses fell from 23.32 per 1,000 in 1847-52 to

7.24 per 1,000 in 1862-'66, and during the same period cases of non-specific diseases of the lungs fell from 104.7 per 1,000 to 3.59 per 1,000. The only condition present to account for this remarkable change was increased facility for the ventilation and increased cubic space. (Paper read at Vet. Cong. of H. and D., 1890.)

Now we know that the average dairy barn is very imperfect in this respect. I have seen barns so close that a lantern hung up in the barn in the evening would go out before morning for want of air. One can hardly go into any barn in the morning without feeling the hot, close smell of the cattle, so strong sometimes as to be over-powering, and yet the average farmer will tell you when he has a barn of this description that he has a nice, comfortable, warm barn. The hotter and closer it is the more comfortable he seems to think it.

Drainage is another important matter that is too often entirely neglected; it is just as important to have the cow-barn and yard well drained, as it is to have the house and surroundings well drained. The statistics collected by Dr. Buchanan on this subject are highly suggestive, and their importance must be my excuse for their introduction here.

In Salisbury, Eng., after the introduction of improved drainage, the annual death rate from phthisis fell from $44\frac{1}{2}$ per 10,000 to $22\frac{1}{3}$ per 10,000 between 1837-'64. In Banbury the phthisis death rate fell in the same length of time from $26\frac{2}{3}$ to $15\frac{3}{5}$ per 10,000. In the same period of time in the towns of Ely, Rugby, Worthing, Macclesfield, Leicester, Newport, the death rate fell 47 per cent., 43 per cent., 36 per cent., 51 per cent., 52 per cent. and 52 per cent. respectively in consequence of improvement in drainage alone. And yet this is almost the last thing the farmer thinks of.

Beneath and around the barns stand piles of rotting manure. The urine soaks into and through the wooden floor and drips into the cellar beneath, while the yards and surroundings are usually a mass of decaying animal and vegetable matter. The surface water from this mass of filth often drains into the well, which is usually located in or near the barnyard, forming a cesspool for the collection of surface drainage.

As for good light, every schoolboy knows how essential it is, yet if not wanting entirely, the light is often a mere apology for that commodity. Cattle need light every whit as much as either plant or human beings, and yet I could take you to-day to barns that are supposed to be first-class in every respect, where one needs a lantern to find out whether the pens are occupied or not.

Perhaps, however, the most important factor in predisposing the dairy cattle to tuberculosis is the injudicious management of the dairy stock themselves.

It is generally recognized in the medical profession that when a woman becomes pregnant she should not be allowed to nurse her child, otherwise both herself and her offspring will be the worse for it, both will suffer in health. Fagge says, "In the female childbearing seems to play an important part among the causes of phthisis; and according to Dr. Pollock, it is not so much prolonged suckling that seems to set up phthisis, but the mere fact of suckling at all. Cases associated with childbirth generally run a particularly acute course."

In referring to the foregoing, Dr. Pye Smith says, "These considerations are so important in regard to life insurance, that Sir Risdom Benett and myself have for several years advised the office with which we are connected to count all deaths of mothers in childbirth or after delivery as due to phthisis, unless there is explicit evidence of previous good health." This is possibly an extreme view, but if it is the case, or even if it is only in part true, what must be the result when the dairy cow is not only milked when pregnant, but milked right up to the time of calving; they are fed so as to produce the greatest possible quantity of milk, and every year the dairy cow is expected to bear a calf with unfailing regularity; and when one remembers that this process is kept up, not for one generation only, but for generation after generation, the wonder is that tuberculosis is not far more common than it is, for we have here just the very conditions that are most fitted for its development. Constitutions weakened and vitality lowered through generations of injudi-

cious breeding along with poor sanitary conditions, poor ventilation, poor light and bad drainage; what more do we want what more could we have, even if we wanted to propagate the disease instead of control it?

Prevention.—In considering the measures to be adopted by the authorities for the purpose of controlling the spread of tuberculosis, we must not forget that the disease is not confined to one species of animals, but it may be communicated to and by all kinds of animals, and so long as there remains one tuberculous individual (whether man or animal), there will be danger to all other animals.

But while it is not possible to eradicate it by the process of killing off diseased animals, it is possible to control it to a great extent by improving the surroundings and the sanitary and hygienic conditions of the cattle, and by changing the present method of breeding and feeding to one more in accordance with the dictates of common sense.

In the first place the present provision of the state law ought to be enforced; a competent veterinary surgeon should be appointed as inspector in every city and town of the commonwealth; every dairy should be licensed and periodically inspected (say monthly or bimonthly), each cow ought to be registered and carefully examined for any trace of disease, an especial examination being made of the udders; and no cow ought to be used for dairy purposes unless it is in a generally healthy condition

And further, as suggested by Prof. Walley, "Whenever such disease is detected, power should be given to the inspector to remove the infected animal to a sanitarium or other place for further observation, or to an abattoir for slaughter; if in the latter case it were ultimately found on autopsy that no disease existed of a nature likely to render the meat or milk harmful, compensation should be given to the owner of the cow."

The barns also ought to be periodically inspected for their sanitary condition, which would include the cubic space for each animal, ventilation, drainage, light, cleanliness, water supply, etc.

In this connection I would call your attention to the grant-

ing of licenses to dairies in other countries. In Scotland an act was passed called "The dairies, cowsheds and milkshops order of 1885," in which the Police Committee as local sanitary authority are empowered to make regulations inter alia, for prescribing and regulating the lighting, ventilation, cleansing, drainage and water supply of dairies and cowsheds in the occupation of persons following the trade of cow-keepers or dairymen, and the order declares that no cowshed shall be occupied, if new, until provision is made "to the reasonable satisfaction of the local authority, for the lighting and the ventilation, including air-space, etc. And no cowshed whatever shall continue to be occupied if, and as long as, the lighting and ventilation, including air-space, are not such as are necessary and proper for the health and good condition of cattle therein;" and in a report to the Glasgow Board of Health, Dr. Russell, the medical officer of health, recommends:

1st. "That the registration, regulation, and control of byers should be placed in control of the sanitary authority.

2d. "That in all existing byers the cubic space should be raised to six hundred cubic feet, that in all new byers it should be eight hundred cubic feet, and that the regulations generally as to lighting, ventilation, drainage, cleansing, and water supply should be carefully revised so as to give full effect to the mind of the sanitary authority, and thereby enable them to discharge themselves of the responsibility imposed upon them by the legislature." (McF. vol. p. 96.)

Denmark and Italy are, I believe, the only countries in the Continent of Europe that pay any special attention to the sanitary condition of the dairies. Great Britain and other countries are fast beginning to realize the importance of the subject, and it would be well if some such regulation as the above, regulating the granting of licenses to dairies were in force here.

Again, in the matter of meat supply, abattoirs should be established, and all private abattoirs should be abolished or licensed, and made subject to inspection at all times. France and Germany take the lead in this respect. In Berlin all meat is inspected and stamped with a government stamp be-

fore being exposed for sale. Special officers are appointed to see that no meat is smuggled in without inspection, and all meat found exposed for sale without the government stamp is confiscated and the seller prosecuted.

"In Berlin the staff engaged in meat inspection at the central abattoir comprises (besides common workmen), two hundred and thirty-nine persons including the director, nineteen veterinary surgeons, six assistant veterinary surgeons; other fifteen veterinary surgeons are engaged in the inspection of carcases slaughtered and brought into the city." (Jour. Com. Path. vol. 3, p. 188).

Now while it might not be advisable to go to the length Germany has gone in this matter, yet here we have not gone far enough. It is the duty of the government to protect the public by making meat inspection compulsory, and to provide competent meat inspectors. It is much more the duty of the government to see that dairies from which the public get their milk supply are clean and in good order, and that the sanitary conditions and surrouudings are as nearly perfect as possible.

It is true that an enforcement of dairy inspection might result in hardship to certain individuals, but the public have a right to claim protection.

It may also be urged that it would be almost impossible to control the milk supply of a large city like Boston, which receives its milk supply from all the surrounding country, but it seems to me it would be a simple enough matter if the State authorities had the power to grant licenses and were to divide the State into districts, each district being in charge of an inspector, whose duty it would be to inspect all dairies in his district; no person being allowed to sell milk without a license.

And in conclusion, until some such regulations are in force here, and until greater attention is paid to the health and constitution of the dairy stock, and to the cleanliness and sanitary condition of the barns and their surroundings, all efforts to control and reduce tuberculosis in our dairy cattle must result in failure.

CATTLE TRANSPORTATION.

By Dr. Williamson Bryden, V.S., Boston, Mass.

In looking over "The Proceedings of United States Veterinary Medical Association," a copy of which I have just received, I am rather sorry to have to admit to disappointment.

Owing to my article being in a rather unfinished condition at the close of our meeting at Washington, D. C., in 1891, several errors occurred in it as reported in the AMERICAN VETERINARY REVIEW and in the *Journal of Comparative Medicine*, etc. The discussion following it, too, as reported, I found to be entirely unintelligible. This I took pains to correct the following month, so far as it referred to *what I had said*, but I refrained from criticising the remarks attributed to Drs. Michener, Miller and Faville, of the Bureau of Animal Industry, to which they had been but recently appointed, until they had at least time to correct the remarks attributed to them, should they desire to do so, but which they evidently did not think necessary.

It may be stated that owing to the large size of the hall in which we met, and the small number of members present, its acoustic properties were so poor that it was impossible either to hear one another or to report correctly what was said, especially in the discussions. I regret further to say that a similar mistake was made in Boston, at the last meeting, where a hall capable of seating over five hundred was secured, to seat what experience had proved would not exceed one hundred persons.

Referring to my article on the Transportation of Cattle, permit me to say that I am disappointed at its not being published as I corrected it, and as I returned it to the Secretary.

Referring to the discussion, I have to say that the remarks of my opponents show such a lamentable ignorance of the subject under discussion that one is led to infer that they either did not know, or intentionally tried a bluff.

Dr. Michener had always led me to believe that he was *a particular friend of mine*, so I innocently asked him to delay

the enforcement of the new rule demanding two feet eight inches space on the new ships, instead of two feet six inches in the "tween" decks, which had always proved ample. This he refused me, but immediately granted the request when it was made by the agent of the S. S. Line, and I was dismissed. I regarded this as an unkind, unprofessional act.

Regarding the inland transportation of distillery-fed cattle, if the gentlemen of the Bureau of Animal Industry who opposed me are ignorant of the circumstances attending the shipment of such animals on splendid ships, like the "Georgian" and the "Philadelphian," from the finest port in the United States, they ought to be ashamed to admit it, for the stockyards were filled on several occasions with dead and dying cattle, and so were the cars, both those that carried them to the yards, *and those that carried them to the ships.*

In spite of their assertions to the contrary, too, disinfection of cars and stockyards is still far from being perfect, and their condition as I described them still prevails, with the possible exception that parts where mudholes were liable to be formed in spring have been filled and sometimes paved.

Shortly after the meeting in Washington, the Hon Mr. Rusk issued a report, in which he admitted his inability to enforce sanitary measures on the railroads without further assistance from Congress, and I still insist that the British ships have been discriminated against by the United States. They have been treated unfairly, and charged with losses of cattle the railroads were entirely responsible for, as the gentlemen ought to have known.

They took the trouble to remind me of what the law requested me to do, as if I did not know, after fifteen years' experience, that it had become the duty of the representatives of the Bureau of Animal Industry, and not mine, at least within the last three years. The claim, so modestly made by the Bureau officials, that in the short period of their rule, some three years, they have succeeded in reducing the mortality among cattle on the ships from six per cent. to one-half of one per cent., is so simple that it is "childish bounce," the fact being that the rate of insurance has not been more than from

one and one-half to two per cent. within the last half dozen years and more.

Last year I inspected for a single steamship line, the Warren Line, 45,415 cattle, of these 117 (about one-third of one per cent.), died on board ship, but of this small number the death of at least fifty of them was caused by bruises received on the cars, and which did not show in the excitement of loading. None of the cars have cleats on their floors, so they soon become very slippery; only a few have division boards, which are seldom, if ever, used, the consequence is that when the air-brakes are suddenly set, the whole car load is piled on top of one another. Imagine this occurring to a load of heavy, soft-footed distillers, often weakened by confinement, idleness, thirst and exposure both hot and stormy weather, then decide whether it is the duty of the Bureau of Animal Industry to take cognizance of such a state of things, and make special efforts in their behalf or not.

STUDY OF THE PATHOLOGICAL ANATOMY OF PULMONARY GLANDERS.

By Professors E. Leclainche and L. Montane, of the Toulouse Veterinary School (France).

Translated from the *Annales de l'Institut Pasteur.*

(Continued from page 306).

C.—Glanders Lobular Pneumonia.

The tubercle does not constitute the only anatomical expression of chronic pulmonary glanders, for at times glanders lobular pneumonia are found. These lesions are manifested on the surface of the lung, under the form of irregularly disseminated centers, of very variable dimensions, yellowish in color, and when recent, surrounded by a zone of severe congestion. Their section shows a dirty white surface, uniform and granular, with irregular outlines, bounded by a hepatized tissue of a dark red color. The center which appears has a cone with its basis sub-pleural, which reminds one of an infarctus of purulent infection.

Like the tubercle, the pneumonia takes place near the pleura, or the interlobular travea, or at time in the subpleural portions joining two lobules. The pleura, the septa and the alveolar walls are thickened, œdematous and infiltrated with leucocytes. The alveoli are entirely filled with a fibrinous exudate, and a large accumulation of round cells in process of degeneration. A few of the elements have preserved their normal aspect and the smoothness of their outlines; others are indicated only by irregular granulation, representing nuclei destroyed during their segmentation. The alveolar epithelium has entirely disappeared. Over the whole extent of the diseased center, large numbers of small bacilli may be found elongated, more or less separated; very abundant in the alveolar contents, they are disseminated in the walls among the degenerated cellular elements.

This portion of the affected lobule represents a rounded grape, surrounded by a narrow zone of catarrhal pneumonia. In the remaining portion of the lobule and especially in the neighborhood of the diseased center, the vessels are gorged with blood, and disseminated hemorrhages are found in the alveola. Bacilli are again detected here, but in much smaller numbers.

These lesions exactly reproduce what is observed in acute glanders, differing from those by their limited localization.

D.—Vascular and Bronchial Alterations.

The initial lesions of the lymphatic tracts extend rapidly to the sheaths which surround the vessels and the bronchia.

During the first periods of the disease, large accumulations of leucocytes appear in the spots affected, around the large vessels, distending the adventitious tunic and transforming it into a large annular lymphatic sheath. A little later, the walls of the vessel undergo marked alterations: round cells penetrate into the middle tunic, while the endothelium swells, proliferates and becomes loose. The leucocytes infiltrate all the walls, and break into the vessels, and with them enter numerous bacilli; some free, others enclosed in the cells. The imported leucocytes have, most of them, undergone a be-

ginning of alteration; their nuclei are in process of segmentation. Among those which contain one or several bacilli, some seem yet intact, while others show a broken, granular nucleoli, with their outlines scarcely indicated.

In some places the inflammatory troubles are very marked, and reach to the total destruction of the walls and the obstruction of the vessel. Then, under a section, a wide zone of embryonic tissue appears containing several muscular, smooth cells, the remains of the middle tunic, and occupying the lumen of the vessel, a granulation of embryonic tissue.

Lesions of similar order are met near the bronchi. The leucocytal infiltration of the peri-bronchic lymphatic tissue is followed by the inflammatory reaction of the walls. The dermis of the mucous membrane, infiltrated with numerous migrating cells, thickens and granulates in the interior of the canal, while at the same time the epithelium proliferates and falls off. The leucocytes break through the walls and form on some projecting point granulations which practically close it. With them bacilli enter the bronchi, and they are seen sometimes in very large numbers, encased in the immigrated cellular elements and the loosened epithelium, into a mucous exudate which fills up the bronchial cul-de-sacs.

The granulating of the walls going on, the cavity is gradually obstructed and subsequently completely obliterated in some places by an inflammatory granulation.

III.

The preceding observations, though incomplete, present an outline of the principal methods of pulmonary infection. The bacilli are first met in the lymphatic tracts, and slowly progressing they give rise at every point to stasis of the lymph and to an abundant leucocytosis. These very manifest lesions were not overlooked by the first observers. They are those which constitute the "infiltrated glanders" of Leisering and the "lymphatic œdema" of Rabe. But their pathogeny is very different from that which they gave it, since, instead of constituting a passive phenomenon, the simple mechanical result of an obstacle to the circulation more

or less distant, they are an expression of an active process of reaction, due to the presence of the bacilli, and instead of expressing a secondary and accessory accident, the lymphatic œdema explains the primordial and essential fact of the infection.

The lymphatic glands enact the part of *vector* of the virus, and this fact is interesting, in that it shows the similarity of the processes of glanders infection in the various organic territories (farcy). In this, the bacilli meet generally but an insufficient resistance in its spreading march. Nothwithstanding the abundance of leucocytes, the phagocytosis does not seem to be active, and the bacilli remain free among the perfectly living cell that surrounds them. The microbe, however, does not meet either with conditions favorable to its pullulation, and though this first stage of defense is most commonly only very slight, in some cases it increases and impresses itself more strongly. Some of the cases above recorded seem to demonstrate that infection may be interfered with, at least for the time being, after a new flow of migrating cells upon given parts. The reaction is very well indicated by the gathering of the leucocytes in masses, and especially by the edification of the pseudo-tubercles, constituted by agminated follicles. *A priori*, it justifies us in considering as possible the localization and the destruction *surplace* of the agents of infection from that first period.

Very generally, lymphatic centers (media) do not offer sufficient resistance to the invasion, and the bacilli spread diffusely in the interlobular septa to reach the peri-vascular and peri-bronchial lymphatic spaces. The entrance of the bacillus into the alveolar walls takes place with difficulty, and numerous lobules, isolated by a thick travea, filled with numerous bacilli, are sometimes found perfectly intact. Some accidental conditions, no doubt, produce a local weakening in the defense, which yields to the invasion. It is also remarkable that the tubercles appear by successive growths, and can be admitted by the infection while it remains localized in the lymphatic tracts, until a change in the general condition facilitates the eruption by diminishing the resistance of the tissues.

The presence of the bacillus in the alveolar walls coincides with the repletion of the alveoli by a fibrinous exudate; the gathering of leucocytes in the middle part of the diseased center only taking place later. During all the first steps of the evolution only a very small number of microbes are found in the tubercle. Appearing in the middle of well defined, grayish granulations, it is often difficult to make out some bacilli, while they are in large quantity in the surrounding connective traveas.

The pullulation is indicated by the central degeneration of the tubercle, and at that time only can the bacilli be easily detected by direct examination or by inoculation. The inflammatory reaction of the tissues bring on the isolation of the diseased focus, but the virulency remains for a long time, notwithstanding the alterations undergone by the microbes, and it can be demonstrated by inoculation when we can find in the tubercle only a few granulations without any positive significance.

On the side of the bronchial vessels, the bacilli produce the gathering of leucocytes in the lymphatic sheaths, and with it the inflammation of the walls. Direct observation shows that the penetration of round cells into the interior of the vessels is then possible, and also that bacilli, free or intracellular, penetrate, from without inward, the altered walls of the vessel or of the bronchia.

The results of the introduction into the capillaries of the lung of the bacilli could not be foretold *a priori*, but those of the pollution of the bronchia seem evident. The microbes are found in great number on the surface of the inflamed mucous membrane in the center of an abundant exudate, which is thrown out under the form of a discharge. It is thus that the almost constant virulency of the discharge of glanderous horses can be explained, and not as it has been to this day supposed, by the opening of tuberculous centers in the bronchioles. The bronchial alterations being independent of the tuberculous evolution, and subordinated only to the primitive invasion of the lymphatic tracts, one can conceive the virulency of the contents of the bronchia, even in the absence of all macroscopic lesions. It is theoretically admissible that an

animal may be found free from the lesions of pulmonary glanders after a minute autopsy, when in reality numerous bacilli may exist in some parts of the lung in the bronchia of infected regions, and consequently in the discharge. Although the absence of pulmonary tubercles may appear to be established, even after a post-mortem examination, it does not necessarily imply the non-existence of glanders, and that is a fact not at present without interest.

CONCLUSIONS.

To resume: First. In chronic glanders in the horse, the infection of the lung takes place through the lymphatic tracts, and is manifested by tuberculous neoformations as well as by alterations of the blood vessels and of the bronchii.

Second. The glanders tubercle starts by a peri-lobular lymphangitis; the lobule is attacked secondarily from the periphery to the center; the first anatomical indication of the tubercle being a nucleus of fibrinous pneumonia. The middle of the diseased focus becomes afterward the seat of a leucocytal apoplexy, followed by the caseous degeneration of the elements, with a peripherical reaction, which attains to the development of an epitheloid belt lined with a connective envelope.

Third. A peculiar anatomical form is due to the development of agminated lymphoid centers in the interlobular septa, in which form the pseudo-tubercle much resembles, histologically, the *lymphadenoma*.

Fourth. An exceptional alteration is constituted by the development of a center of alveolar pneumonia, surrounded by a hemorrhagic zone. This form constitutes a very limited focus of acute glanders.

Fifth. The blood vessels and the bronchii from the first stages of their development undergo important alterations. Their inflamed walls are penetrated by leucocytes and bacilli, which have been introduced through the medium of the lymphatic sheaths. Even when the lesions are very small, and in appearance localized, bacilli appear in the blood; and again, they are found in abundance in the bronchia, and consequently in the discharge.

CASTRATION OF CRYPTORCHIDS.

By Prof. F. Mauri, of the Veterinary School of Toulouse, France

(Continued from page 315).

2d.—Inguinal Cryptorchidy.

This includes four steps: First, the exposure of the inguinal ring; second, the prehension of the testicle; third, its ablation; and fourth, the cleaning of the wound.

1st. The first step comprehends the same manipulations as in the abdominal operation.

2.—*The Prehension of the Testicle.*—The organ is situated, more or less, high up in the inguinal tract. Sometimes it is down at the inguinal ring, and then easily taken hold of. When it has remained in the bottom of the groin, the operator carefully introduces the hand into the inguinal canal, as in abdominal cryptorchidy. Then one of two conditions is present: either the testicle, if the cord is sufficiently long, can be drawn down to the inguinal ring, or it remains well up in the inguinal canal. In the first case the operator pulls it to the ring, and incises the vaginal sac with the convex bistoury, as in the operation of castration with uncovered testicles. In the second case, the ablation of the organ must be effected while leaving it covered with the vaginal sac in the depth of the groin.

3.—*Ablation of the Testicle.*—Enucleated from the vaginal sac and drawn out near the inguinal opening, the testicle is cut off in the usual way. If, on the contrary, the organ is still in the deep part of the inguinal tract, the ecraseur is used, applying it on the outside of the cord, constituting the covered operation. In five cases I was obliged to use the ecraseur once, and in the four others the limited torsion.

4.—*Cleaning the Wound.*—Free washing with cold water, and after drying, sprinkling the scrotal region with Van Swieten's solution, as was recommended in the operation for abdominal cryptorchidy, will usually suffice.

Subsequent Care and Sequelæ.—When allowed to rise to his feet the animal is rubbed, covered with blankets, and taken to his stall, and tied up high for forty-eight hours to prevent

him from lying down. In compliance with the directions of Degive and Jacoulet, I have the hind quarter raised by a thicker bed of straw, though I think this is generally useless. It is justifiable, however, if complications arising from improper manipulations are to be feared. During the first day the animal receives about ten pounds of straw and mashes made of barley flour. On the next day he has hay and oats, and toward the fifth or sixth day is put upon his ordinary rations.

The sequelæ of the operations are similar to those of ordinary castration by limited torsion, which I have exclusively adopted for the past eight years. The patient is kept quiet in his stall, and generally paws the floor at intervals for the first twenty-four hours, and does not attempt to lie down. In none of my cases have I observed signs of fever, or even colic, such as commonly occur in animals castrated with clamps. On the second day after the operation, the patients begin to have exercise, and are left at liberty afterward. During this first period, they are slightly indisposed and eat carelessly. There is stiffness of the loins, and they walk sore, but they soon begin to lie down and improve. The sheath becomes the seat of a swelling of varying dimensions, perhaps extending under the abdomen, but requiring no special care. There is some suppuration at the scrotum, escaping passively, but more abundantly when the animal is walked. Cicatrization is complete in from fifteen to twenty days. Such is all the care bestowed upon my patients, and such are the results obtained.

Accidents.

The two principal complications which may be noticed after the castration of cryptorchids, are eventration and peritonitis.

1.—*Eventration* has been observed at the moment when the animal is getting upon his feet. It takes place because the perforation of the inguinal canal has been made too low down, or because the hand, badly directed, has penetrated the abdomen by tearing through the small oblique. To relieve this complication, according to Mr. Degive, the reduc-

tion may be made while the horse is either on his feet or lying down, by external taxis alone or with traction upon the intestines through the rectum. If the animal is kept standing the reduction is facilitated by placing him on an inclined plane with his hind quarters elevated. Keeping this position one or two days is generally sufficient to prevent the return of the accident. A strong and tight suture, taking a considerable portion of skin between the stitches, will help. If these measures are not sufficient, the direct suture of the inguinal canal may be attempted. Two or three distinct sutures will be all that is required. With a short needle a suture can with but little difficulty be passed through the crural arch and the anterior lip of the ring, so as to bring them together and obliterate entirely the principal hernial sac.

2.—*Peritonitis*, is, it seems, a more frequent accident than the first. It is indicated by an elevation of temperature, anorexia, sensibility of the abdominal walls, slight colics, etc. The treatment recommended by Mr. Degive consists in the application of a sinapism on the abdomen with vesicating frictions, this revulsive action being seconded by the administration of electuaries or drenches, with cinchona, creosote, aconite, etc. Laxatives and phenic acid beverages are also indicated against the constipation and the infection which accompany peritonitis.

REPORTS OF CASES.

"Careful observation makes a skillful practitioner, but his skill dies with him. By recording his observations he adds to the knowledge of his profession, and assists by his facts in building up the solid edifice of pathological science."—VETERINARY RECORD.

ASCITES IN A BITCH.

By C. CLAYTON, D.V.S., House Surgeon American Veterinary College—Hospital Department.

On October 15th, 1892, a small terrier dog was brought to the hospital for observation for pregnancy, the owner saying she had been lined and was due to whelp in three weeks. The abdomen was somewhat pendulant, but otherwise showed no signs of pregnancy, so was returned home the same day.

On November 14th, 1892, the dog was again brought to hospital, this time a week overdue and the abdomen greatly distended, and on examination a diagnosis of ascites was made. The animal was tapped that day, and under the following dates:

Nov.	14,	1892,	5	pts.	2	ozs.	Feb.	21,	1893,	6	pts. 10 ozs.
"	21,	"	4	"	3	"	Mar.	7,	"	7	"
Dec.	1,	"	4	"	7	"	"	21,	"	6	" 14 "
"	8,	"	3	"	4	"	April	8,	"	7	" 8 "
"	17,	"	5	"			"	26,	"	8	" 8 "
"	27,	"	4	"	6	"	May	13,	"	7	" 12 "
Jan.	5,	1893,	4	"			"	29,	"	5	"
"	14,	"	4	"	5	"	June	19,	"	7	" 8 "
"	24,	"	6	"			July	10,	"	5	" 4 "
Feb.	7,	"	6	"	4	"	"	31,	"	6	" 6 "

After the last tapping, when returning home, the dog had grown so weak that the owner decided to have her destroyed, so returned to the hospital where she was chloroformed. Upon post-mortem, the liver was found to have undergone waxy degeneration and increased in size, and the capsule drawn so tight that the lobes were only distinguished by their free border; the kidneys were perhaps slightly enlarged; the heart was hypertrophied, and the valves very much thickened; everything else appeared normal.

The internal treatment of this animal consisted of chloride of iron three drops three times a day, and having no results from this, bitartrate of potassium was used, but without results. The idea of putting a silver tube into the abdomen so that the owner could draw the fluid off was suggested, but he preferred to bring the animal to the hospital.

To us this seemed an interesting case, as the dog only weighed about thirteen pounds, and had, as you see, over fourteen gallons of fluid taken from her.

LARGE INTESTINAL CALCULUS.

By John Michin, V.S., Goshen, N. Y.

I send you by express a calculi taken from a mare through the regular course or channel of the bowels. A calculi, the like

we in all our practice had never seen passed through the regular channel before. Therefore, we thought it might be a little interesting to you.

History.—The subject was a bay mare 15-1, six years old, and trotting bred, valued by her owner at $1,000, and up to morning of the 10th inst. was supposed to be all right. She with her mate were driven about eight miles to a "picnic," and soon after was taken with colic. We were called to the case, and at 11.40 A.M. saw the patient; found her rolling and trying to get on her back; pulse 56, and sweating profusely.

Treatment.—Gave chlo. hyd., ʒ ix in sol., and as soon as I could obtain it (which was thirty-five minutes) lini. oli. Oiss. The patient seemed to get relief, but in about one hour the pain returned, when I gave her another dose of chlo., increasing it to ʒ iss, which seemed to have the desired effect. As her owner had to come by my place on his way home, I requested he should stop and let me see her, which he did, with the information that nothing had passed her bowels since I saw her. I had her removed from the wagon, gave her a "pill" of aloes, ʒvii, also of soap-suds; told him to give her a loose box, and that I would see her early next morning. On my arrival at 7.23 A.M. next day, found the mare out with his man to a halter, and the owner with a whip in the act of making her move more lively (as he expressed it). In turning she made a jump to get away from the whip, where, for the first time in twenty hours, there was a convulsive movement of the bowels, and with that movement this (to me) large calculi, weighing eleven ounces, was produced. Who can prophecy how long it took in its migration after it left the viscus till its ejection? Again, I attribute its safe delivery to the free use of the oil.

EXTIRPATION OF A TUBO-OVARIAN CYST.

By Dr. Archibold, V.S.

A short time ago at his hospital on Broadway, Dr. Pierce, of Oakland, California, performed the above operation successfully. The doctor was ably assisted by Dr. H. A. Spencer and Dr. Rowland Lord, both of San Jose.

The subject was a six-year-old thoroughbred mare called Lady Emily, sired by Three Cheers; dam Queen Emma, by Woodburn; bred by John Arnet, of Pleasanton, Cal., and at present owned by J. B. Chase, of San Francisco, and handled by the well-known trainer, Thos. G. Jones.

The mare since she was three years old had been bred to several first-class horses, such as Imp. Cheviot, Imp. Friar Tuck, etc., but without success.

Last June Mr. Jones, seeing that she was rapidly losing her health (and in fact she commenced declining so fast that it became absolutely necessary to have some medical or surgical attention for her), had her examined by several reputable veterinarians, who diagnosed her case as prolapsus uteri, and she was considered by them as incurable. The mare kept getting worse until Mr. Jones decided to take her to Oakland and have her examined by Dr. Pierce, who (as will be shown later) correctly diagnosed her trouble as being due to a disease of the right ovary, and he decided that it would be necessary to extirpate the diseased organ before it would be possible for the mare to regain her normal condition.

He found that there was a continual discharge of a reddish brown fluid mixed with mucous from the genital organs, and the uterus and vagina were in a highly catarrhal condition. The right fallopian tube was also found to be enlarged, and indurated to the touch.

Having gained permission from the owner to operate on the mare, he invited Drs. Spencer and Lord to assist him.

He then proceeded to prepare the animal as follows: A few days prior to the operation laxatives were administered until the fluid (slightly fæculent) evacuations showed that the intestinal canal had been emptied. The uterus and vagina were washed out twice daily with a weak solution of phenol.

The animal was pronounced ready for the operation on July 31st, when the visiting surgeons, on Dr. Pierce's invitation, made a thorough examination, agreeing with Dr. Pierce in that the removal of the right ovary was necessary to save the animal's life. Owing, however, to the inflammatory and

catarrhal condition of the vagina it was decided not to operate in the usual manner through the vagina, but through the flank. Two hours before the operation the rectum was emptied by an enema.

Only a small number of instruments were selected and placed in readiness in an antiseptic solution of phenol, such as bistouries, artery forceps, scissors, suture material, sponges and a Paquin cautery for cauterizing the bleeding surfaces.

The subject was placed on the operating table and put under the influence of chloroform. The abdominal wall was well washed with soap and water and an antiseptic fluid.

The hair and upper layers of the epidermis were removed off a place midway between the last rib, thetransverse processes of the lumbar vertebræ and the anterior iliac spine.

A spray was suspended over the field of operation, the spray being filled with a solution of lysol, the parts operated on were by this method kept continually saturated. An incision was made through the skin and paniculus carnosus, the fibres of the abdominal muscles being separated by the fingers until an opening was made large enough to admit the hand of the operator; the hand was then inserted through the peritoneum into the abdominal cavity; the ovary was grasped and brought to the opening, where with the scalpel the peritoneum (which was very much thickened) was severed and the ovary with a portion of the fallopian tube was removed with the ecraseur. Peritoneal toilette was dispensed with as very little blood had escaped into the abdominal cavity.

The peritoneum was then sutured with carbolized catgut, the end of the sutures being left long enough to act as a drainage tube; the muscles and skin were sutured with silk.

A dressing composed of hydrargyrum chloridum mitr. ʒ ij, and acidum boricum ʒ i was dusted on the wound; three yards of antiseptic gauze (mussed up) was put over this, and over this was placed about a quarter of a pound of absorbent cotton, and over all a strong muslin roller wound round the abdomen, and secured so it was impossible for it to slip forward or backward.

The after treatment consisted of ʒ ii doses of extractum arnicæ radicis fluidum every hour for the first twenty-four

hours, and three times daily afterward. A tepid solution of sodium chloride and zinci chloridum was injected into the uterus twice daily.

Two hours after the operation it was found necessary to administer two grains of morphiæ sulphas hypodermically, in order to quiet the animal, as she was very nervous.

The dressing was removed at the end of two weeks, when it was found that the wound had nearly healed, and there was no trace of pus having formed under the dressing. A fresh dressing similar to the first was applied and left on until the wound had perfectly healed. On the morning after the operation her temperature was 102°, pulse 48, and from that time on the pulse and temperature gradually decreased until they reached their normal condition.

The mare at the present time is healthier and more thrifty than she has been for four years, and it is thought by the attending veterinarians that she may be pregnant next year.

Upon examining the extirpated tumor it was found to be what is commonly called a "tubo-ovarian cyst." The outer surface of the ovary was perfectly smooth. The cyst was as large as two fists, and contained a considerable quantity of thick, brownish-red fluid. The inner surface presented washy excrescences in places. The fimbricated portion of the tube took part in the promotion of the cyst, so the index fingers could be passed from the cyst into the tube. As was mentioned before, the extirpated cyst (which looked somewhat like an ordinary cystoma) also contained a portion of the fallopian tube, which was dilated and thickened. The median portion of the fallopian tube presented a broad mesosalpinx, while the lateral portion ran into the wall of the tumor. On being opened, the tube discharged a thick, brownish-red fluid, and could be followed laterally into the cyst. When seen from the cyst the opening of the tube was markedly convoluted, and the fimbriæ passed over upon the inner surface of the cyst as prolongations of the longitudinal folds. It would be well to say here that the entire tumor was covered with peritoneum, and but a comparatively small portion was situated in the broad ligament.

In regard to the adhesion of the tube to the ovary (since

it is not a part of physiological ovulation), it must have preceded the rupture of the cyst, and the formation of the tubo-ovarian cyst is due to the assumption of a catarrh of the tube and follicle. The tubal catarrh causes circumscribed peritonitis and adhesion of the tube. The catarrh of a follicle causes its dilatation, and its rupture into the tube produces the tubo-ovarian cyst. The first stage in the process is adhesion of the fimbriæ, which can occur only on the peritoneal surface; the fimbriæ and their terminatives are therefore directed inward. This results in dilatation and dropsy of the tube. If a follicle now matures or forms a serous cyst, and ruptures into the tube, the tubo-ovarian is formed. Further secretion of the tube will enlarge the ovarian part of the cyst. This explains the fact that the ends of the fimbriæ are found upon the inner surface of the cyst. The reason that this cyst did not increase in size is due to the fact that the tube was always pervious in the direction toward the uterus, and increased pressure within the cyst occasionally gave rise to a discharge of fluid into the uterus.

SOCIETY MEETINGS.

NEW YORK STATE VETERINARY SOCIETY.

The fourth semi-annual meeting of the New York State Veterinary Medical Society will be held in Buffalo, N. Y., on October 11th and 12th, 1893. The meeting will convene at the assembly room of the Genesee Hotel at nine o'clock A.M. October 11th. It is expected that there will be present several visiting delegates from Europe and from the Eastern States, and this will tend to make it an unusually interesting meeting to all who attend. A cordial invitation is extended to all members of the profession to make a special effort to be with us. Printed notices will be mailed soon.

N. P. HINCKLEY, *Sec'y.*

BIBLIOGRAPHY AND EXCHANGES.

Beside the usual large number of exchanges which we receive regularly, we beg also to acknowledge the receipt of the following:

Bulletin of the State Experiment Station of Baton Rouge, La., where an excellent article can be found by Dr. W. H. Dalrymple, M.R.C.V.S., in which acute nephritis, paraplegia and eczema in mules are discussed, with a report on glanders and cerebritis in horses in the State.

Thirtieth Annual Report of the Massachusetts Agricultural College (Amherst). Kindly sent by Dr. James B. Paige, V.S., Professor of Veterinary Science.

Revue de la Tuberculose (Review of Tuberculosis).—A quarterly journal published under the direction of Dr. Vernueil, in which most valuable information is found from veterinary writers, such as Prof. E. Nocard, who writes on bovine tuberculosis; and L. H. Petit, who reviews the work done by Dr. S. E. Weber, of Lancaster, on tuberculosis of rats.

Rapport des Maladies Contagieuses et Epizootiques du Dept. du Nord (Report on the Contagious and Epizootic Diseases of the Dept. du Nord), by M. Pollet.—An official document giving much information of the prevalence in that part of France of such diseases as pleuro-pneumonia, aphthous fever, glanders, bacterian and bacteridian anthrax, tuberculosis, swine disease in its various forms, rabies and actinomycosis.

Nouveau Guide pour l'Examen de l'Œil Fluxionnaire (A New Guide for the Examination of the Eye affected with Periodic Ophthalmia), by Dr. E. Rolland.—A large pamphlet of some eighty pages, illustrated, which introduces to the veterinarian the many changes and various lesions that are presented by the eye affected with periodic ophthalmia, and in which excellent indications are given to guide in the examina ion of the eye before purchase, as well as after, by the expert in case of legal litigation.

The New York Veterinary Journal and Record of Comparative Medicine (No. 2, Vol. 2), in which, among excellent extracts are found two severe criticisms. One upon the exclusive action of English veterinary authorities to recognize American diplomas, and urging similar action on our part in return; the other upon the next meeting of the United States Veterinary Medical Association. While we strongly endorse its remarks in its strong editorial "protection," we regret its remarks as expressed in "timely warning."

Agricultural Experiment Station of Auburn, Alabama, Bulletin No. 43.—Dr. C. A. Cary, D.V.M., writes in this bulletin a little work on ophthalmology, which occupies no less than seventy-seven pages, illustrated with nineteen plates, and closes with a short appendix on "pink-eye," scab in sheep, cerebritis, hog cholera, etc., as he was called to observe in his professional capacity.

Kansas Experiment Station, Bulletin No. 35.—In this bulletin Dr. N. S. Mayo, D.V.S., gives an excellent article on actinomycosis bovis, or lump jaw, illustrated by a number of plates depicting the appearance of the animal affected, the condition of the jawbone, etc., and the microscopic appearance of the fungi. The bulletin is very interesting, and the article ought to be read by all veterinarians. A few observations upon loco are also given.

THERAPEUTIC NOTES.

ACUTE BRONCHITIS.—A teaspoonful every four hours of this simple expectorant mixture is recommended for that affection and would prove advantageous in dogs:

℞ Ammon. Muriat, ℥ ss,
Mist. Glycirrhiza Comp., ℥ iv.
—*The Prescription.*

ECZEMA.—℞ Europhen, ℥ i gr. xv.,
Ol. Olive, ℥ iiss,
Landolini, ℥ ii ℥ v.
M.—Fl. ung.

Again.—℞ Zinci. Oxidi., ℥ i,
Glycerine, ℥ ii,
Mucil. Acacia, ℥ ii.
M.

Sig.—To be applied on extensive patches of eczema. If itching is very severe, one per cent. of carbolic acid may be added.—*The Prescription.*

ANTISEPTIC VALUE OF PHENOCOLL HYDROCHLORIDE.—In the New York *Medical Journal*, Dr. C. Beck reports a number of experiments that he made with this new compound in the dressing of wounds. He has used it in the form of a powder, in five per cent. watery solution, in ten

and fifteen per cent. alcoholic solution, in ten and twenty per cent. gauze, and in ten and twenty per cent. ointment (vaselin and anoline.) From all the experiments he arrives at the conclusion that phenocoll hydrochloride is as valuable an antiseptic as iodoform, and stronger than dermatol, aristol, iodol, pyoctanin, europhen, etc.

Furthermore, it probably surpasses iodoform because it is odorless, dissolves easily, does not produce eczema, is not contra-indicated in kidney diseases, and can be applied on extensive surfaces without fear of toxic effects.

HYDROCHLORATE OF COCAINE.—In *Helbing's Pharmaceutical Record* there is a report of a series of experiments which he made in collaboration with Dr. F. W. Passmore on cocaine preparations. He states that there is hardly any alkaloid compound which is found in commerce in more varying degrees of purity than cocaine, and none which is more important to obtain pure. He found the hydrochlorate prepared by C. F. Boehringer and Soehne free from all impurities, and yielding definite and unvarying physiological action without secondary effects.

VETERINARY NEWS.

Director Dieckerhoff, of Berlin, whom we stated in a previous number of the REVIEW had been sent to the Chicago World's Fair to inspect and report upon veterinary matters in this country, sailed for Europe on the steamer Normannia.

Professors Janson and Banham, of England, who visited this country a short while ago to see the exhibition, are also on their way home.

It is to be regretted that such representatives of our profession in Europe should be allowed to come, stay some time, and leave the United States without the slightest professional recognition.

Foreign Degrees—Another American veterinary graduate has completed his studies in Europe, Dr. Nicholas Louis Nicholas, who graduated at the American Veterinary College, has obtained his diploma at Alfort in the class 1892-93.

SUNDRY ITEMS.

HEREDITARY IMMUNITY FROM RABIES.—Tizzoni and Cantani have shown, experimentally, that in rabbits artificial immunity from rabies may be transmitted from the father to the offspring. They experimented upon the young of three litters. The male had been strongly immunized against rabies, while the mother could be considered normal in regard to rabies, although she had been immunized against tetanus. The young were inoculated at ages varying from forty-six to seventy-seven days with the rabic virus of the streets, introduced within the dura mater. Invariably, these rabbits that had been inoculated with street rabies did not contract the disease; others, however, which were inoculated with the most virulent form, became ill and died, but much later than control animals.

The authors believe, therefore, that they have, beyond a doubt, proven the possibility of a hereditary transmission of immunity through the germinal plasma.—*Am. Med. Gen. Med.*

ANTI-RABIC VACCINATIONS made at the Pasteur Institute in Paris since 1886. During the year 1892, out of 1,793 persons who have received the treatment at the Pasteur Institute at Paris, seven died of hydrophobia; therefore the death rate was 0.39 per 100. But three of these persons, who came to be treated after a certain time had elapsed after the bite, died during the treatment or before fifteen days after the end of it, and they must be deducted from the number of dead as well as from the persons treated, thus reducing the figures as follows: Treated, 1,790; died, 4; death rate, 0.22.

The number of persons treated since the foundation of the institute is 12,782, of which 68 died—an average rate of 0.52 per cent.

The following contains the same information with regard to the work of the New York Pasteur Institute for the year 1892:

	A	B	C
Bites inflicted on head and face. simple	..	.. 1	....
multiple	5 } 5	.. 1 } 2	.. 1 } 1
Cauterization efficacious	.....	.....	.....
non-efficacious	2.....	.....	1.....
No cauterization	3.....	2.....	.....
Bites inflicted on the hands. simple	..21	..13	.. 4
multiple	.. 9 } 30	..19 } 32	.. 4 } 8
Cauterization efficacious	1.....	1.....	.....
non-efficacious	11.....	16.....	3.....
No cauterization	18.....	15.....	5.....
Bites inflicted on the limbs and body... simple	.. 5	.. 4	.. 6
multiple	.. 2 } 7	.. 4 } 8	....} 6
Cauterization efficacious	.....	1.....	2.....
non-efficacious	4.....	2.....	1.....
No cauterization	3.....	5.....	3.....
Clothes torn	2.....	3.....	.....
Bites inflicted on bare parts	1.....	1.....	1.....
Bites inflicted on different parts of body...	 5	.....	.....
Cauterization efficacious	1.....	.....	.....
non-efficacious	1.....	.....	.....
No cauterization	3.....	.....	.....
Clothes torn	.....	.....	.....
Bites inflicted on bare parts	4.....	.....	.....
Amounts	 47	42	15
	A	B	C
General Total		104	

The column A refers to persons bitten by animals in which hydrophobia has been evidenced by experimentation or by the death of some other persons or animals bitten by them; column B to persons who have been wounded by animals having been recognized rabid by the clinical or veterinary examination; and column C to cases in which hydrophobia could only be suspected, as the animals had disappeared or were killed instantly and their bodies thrown away.

These 104 persons treated are distributed throughout the States as follows: Alabama 2, Connecticut 13, Iowa 2, Louisiana 1, Maryland 4, Massachusetts 5, Michigan 1, Mississippi 1, Missouri 2, New Jersey 40, New York 7, North Carolina 2, Ohio 2, Pennsylvania 2, South Carolina 1, Tennessee 3, Texas 2, Virginia 14. No death has been reported among these persons.—*N. Y. Therap. Review.*

FOR SALE.

Veterinary practice (established four years) in city of forty-five thousand (45,000) in farming country. Only one other graduate within one hundred and ten miles. Cool summers. Good climate. Good schools. Price ($500) five hundred dollars cash. For particulars etc., apply,

DR. POE, V. S.,
Knoxville, Tennessee.

T F